

# PHILIPS MODEL 666A

## *radioplayer*



### SERVICE DATA

FOR

### PHILIPS AUTHORISED SERVICE DEPOTS.

BULLETIN No.1

#### DESCRIPTION.

6 valve superheterodyne for use on 230 volts 50 cycles.

|                         |                     |
|-------------------------|---------------------|
| Power consumption ..... | 75 watts            |
| Broadcast range .....   | 550-1500 kilocycles |
| Shortwave range .....   | 5.5-15.5 megacycles |

#### Valves used:

|                          |                            |
|--------------------------|----------------------------|
| E.447. Cap. E. ....      | R.F. Amplifier             |
| A.K.1. Cap E. ....       | Frequency changer (Octode) |
| E.447. Cap E. ....       | I.F. Amplifier             |
| E.444. Cap J. ....       | Single Diode-Tetrode       |
| E.443H. Cap N. ....      | Penthode                   |
| 1561. Cap G. ....        | Rectifier                  |
| Undistorted output ..... | 2 watts                    |

#### GENERAL TECHNICAL INFORMATION.

**Intermediate Frequency:** In spite of the high image ratio obtained from this receiver on broadcast (viz., 10,000), it has been found necessary to alter the normal intermediate frequency of 256 k.c. to 285 k.c. for Christchurch and Dunedin where two powerful stations produce a beat equal to the 256 I.F., thus causing an apparent lack of selectivity and a blanketing effect between the two stations.

If the Serviceman requires to know the I.F., application to Wellington may be made if the serial number is quoted. Alternatively, if a strong signal from the test oscillator is fed into the receiver at 1200 k.c. the image repeat will be found on the dial at a point equal to twice the I.F., i.e., if the I.F. is 256 k.c., the image will be at 688 k.c.

For 285 k.c. I.F. the image will be at 630 k.c.

#### A.V.C. ACTION:

A.V.C. is fed to the R.F. and frequency converter stages only. As a single diode is used, there is no delay action. As the A.V.C. line is from the cathode of the E.444 through the diode load resistor, the positive potential of 2 volts set up across the E.444 cathode resistor is fed back to the grids of the controlled tubes, consequently the cathode resistor of the controlled tubes has been designed to develop an increased bias to offset this. In order to permanently fix the drop at the E444 cathode res. irrespective of variations in valve constants, a bleeder current has been passed through this cathode resistor via the "earthed leg" of the potentiometer for the screens.

## SENSITIVITY:

The normal sensitivity on broadcast is 1-2 microvolts absolute (.25-.5 microvolts per metre), and on short waves is 6-12 microvolts absolute (1.5 to 3 per metre). Actually the broadcast sensitivity can be .1 microvolt absolute, but as this extreme sensitivity can be rarely used, it has been purposely reduced by means of a bleeder current from positive B, through 25,000 ohms. to the I.F. cathode, thus increasing the bias on the E.447 I.F. It will be noted from the diagram that this bleeder current is only switched in circuit when the wave-change switch is switched to "Broadcast," thus leaving the shortwave section at full normal sensitivity. Shortwave sensitivity can be further improved by shorting the metal coating of the A.K.1 to chassis, but as this adversely affects the broadcast band, it has not been arranged for. If it is found advisable to still further reduce sensitivity on broadcast for very noisy areas, this may be done quite simply and effectively by connecting an extra 50,000 ohm. resistor from the same switch contact as the I.F. bleeder and taking it to the common cathode of the R.F. and A.K.1 tubes, thus increasing the bias on these tubes when the set is switched to broadcast..

## TO LINE MODEL 666a.

### Service Instruments Required:

Accurately calibrated modulated oscillator for 256 and/or 285 k.c., and for 550-1500 k.c., and preferably for 5.5-15.5 Mc. Output meter with speaker adaptor. Dummy aerial for broadcast and with 500 ohms in series for shortwaves.

1. Connect oscillator output through a fixed condenser (.1 mf.) to the grid cap of A.K.1 and chassis and line up I.F.'s.

2. Connect oscillator output through dummy to aerial and earth terminal of set. Turn dial pointer and oscillator to 1400 k.c., after first making sure that the pointer coincides with the scale termination at the low frequency end of dial. The condenser vanes should now be full in without the gears having piled up.

Turn oscillator trimmer for maximum output and thereafter the remaining two trimmers.

**THE SHORT WAVE TRIMMERS ARE MARKED WITH A RED SPOT.**

3. Turn dial and oscillator to 600 k.c. and adjust paddler for maximum output.

4. Re-check at 1400 k.c.

5. Insert 500 ohm. resistor in series with dummy and check line up of short wave section until reasonable uniformity of sensitivity is obtained all over the dial. There is no paddler for short waves.

6. On no account must the end plates of the tuning condensers be bent.

**NOTE:** On short waves, it is essential that the oscillator must be at a higher frequency than the R.F. circuits. It is easy to tune it to the wrong side. To check this, tune to say, 12 M.C., and if the adjustments are correct, the image repeat should be reappear at 11.43 M.C. (for 285 I.F.) or at 11.49 M.C. (for 256 I.F.). Generally it will be found that the short wave oscillator trimmer must be nearly all out, the middle short wave trimmer fairly well in, and the R.F. trimmer about midway. It may be advisable to check the adjustment of the R.F. trimmer with the set connected to an average aerial and peaking on a signal or noise.

Naturally a good service oscillator for short waves is necessary to obtain maximum overall sensitivity on the short wave band, but realising that servicemen are generally poorly equipped in this respect it is necessary to issue the following warning:—

Only a highly skilled serviceman can make a reasonably good line up on the short-wave band, and therefore, if this facility is not available, we strongly recommend that the receiver be returned to our Wellington office or some other Philips serviceman equipped with efficient instruments and the necessary skill.

## CIRCUIT NOTES:

For socket connections, see blueprint for "PHILIPS VALVE BASE CONNECTIONS."

In some of the earlier serial numbers the following variations will be found:—

1. The potentiometer for the E.444 screen will be found to consist of two 50,000 ohm. resistors. It is advisable to change the earth leg to 25,000 ohms.

2. No 25,000 ohm. resistor (two 50,000 ohm. in parallel) is connected across the speaker field. It is advisable to insert these to reduce the field dissipation.

3. The A.C. hum is excessive. It may be reduced to a satisfactory level by twisting an extra lead with the lead from the volume control to the grid of the E.444 and earthing this lead at the E.444 socket, the other end being connected to the "low" side of the

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### ADDITIONAL NOTES:

The contacts on the wavechange switch are silver-plated. On no account should they

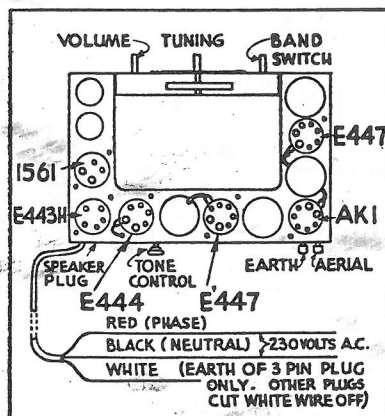
be scraped with a knife or emery paper.

If it is absolutely necessary to clean the contacts, use coarse brown paper, or carefully wash them with carbon tetrachloride.

On no account should the speaker plug be left out, otherwise the 25,000 ohms. across the field may be ruined.

Repeat troubles from local stations should only occur if the receiver is used on a long aerial.

Recommend a .0001 mf. condenser permanently in series with the aerial if it is a long one.



### CIRCUIT DIAGRAM 666A.

